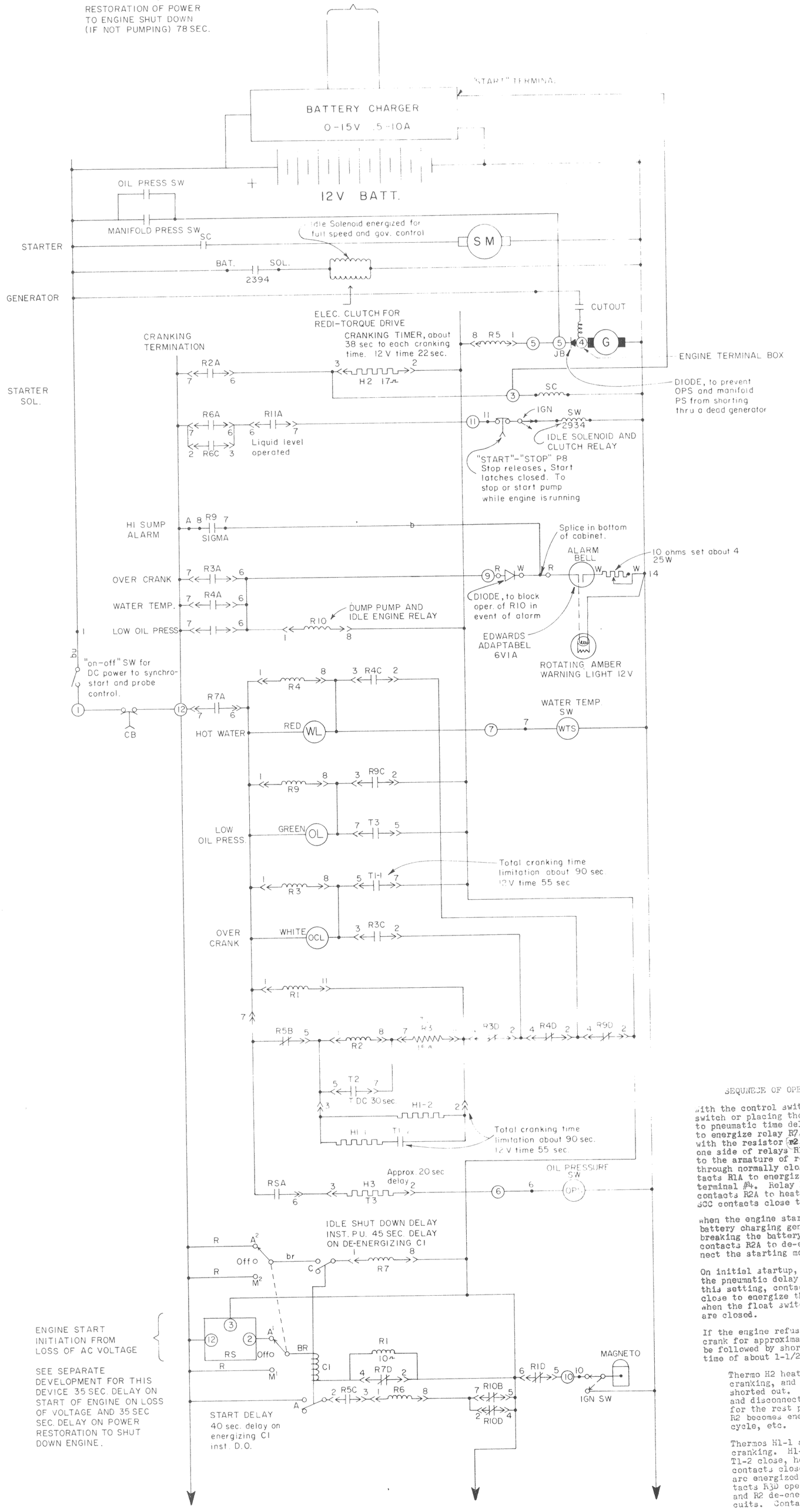

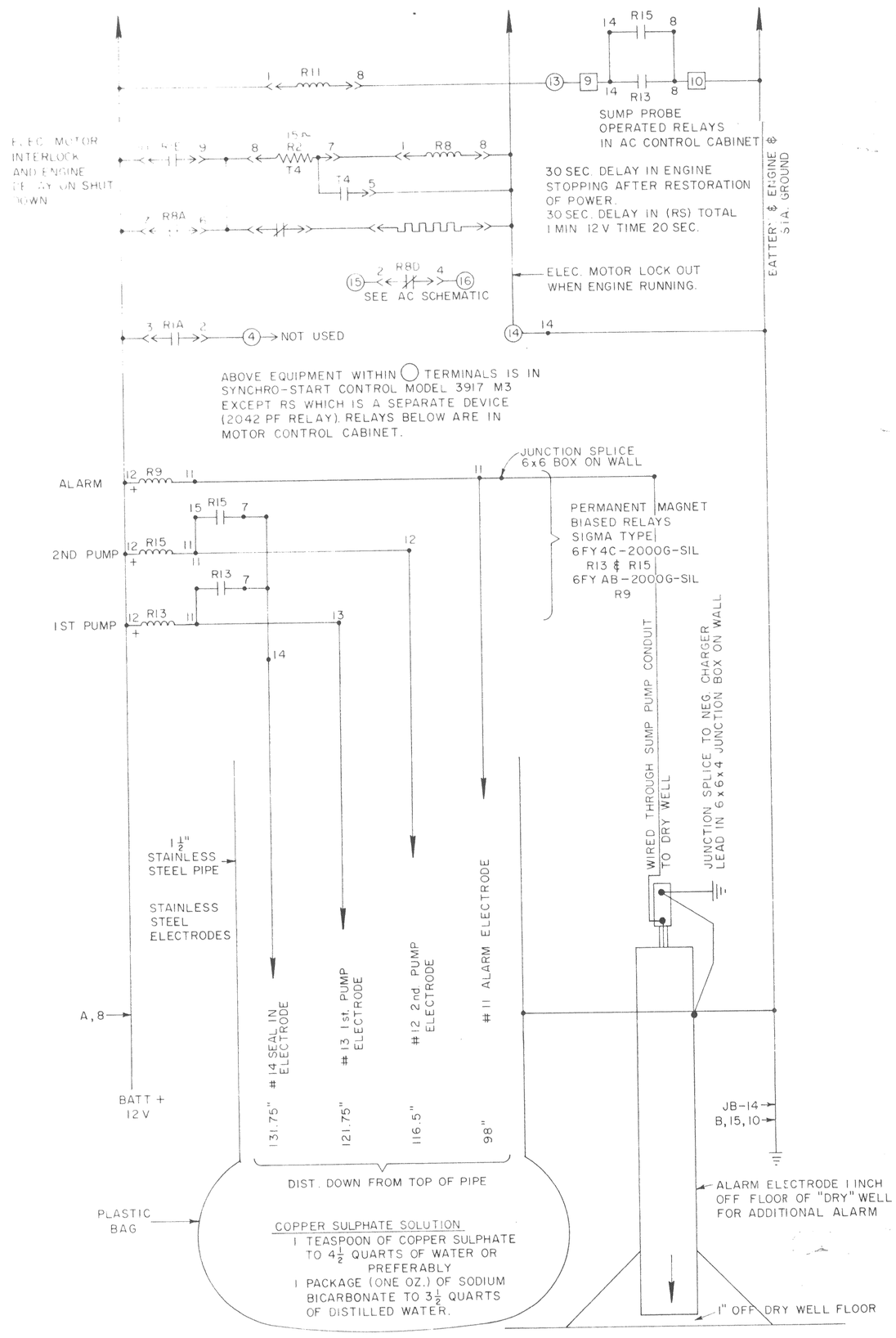

SEQUENCE OF OPERATION FOR MODEL 3917M3 AUTOMATIC CONTROL

With the control switch in the AUTO position, closing of the remote switch or placing the control switch in MANUAL completes the circuit to pneumatic time delay relay coil C1. Contacts C1C close immediately to energize relay R7. Contacts R7D open to place coil C1 in series with the resistor r2. Contacts R7A close to complete the circuit to one side of relays R1, R3, R4 and R5, signal lights OL, WL and OCL and to the armature of relay R5. Relay R1 completes its ground circuit through normally closed contacts R5D, R3D and R4D pulling in its contacts R1A to energize the ignition coil and auxiliary circuits through terminal #4. Relay R2 receives battery through contacts R5B and closes contacts R2A to heat H2 and energize the starting motor contactor SC. SCC contacts close to energize the starting motor to crank the engine.

When the engine starts and begins to run, the voltage output of the battery charging generator picks up relay R5. Its contacts transfer breaking the battery circuit to relay R2. Relay R2 drops out to open contacts R2A to de-energize H2 and SC. SCC contacts in turn disconnect the starting motor.

On initial startup, contacts C1A remain open for the time setting of the pneumatic delay switch controlling the warmup idle period. After this setting, contacts C1A close energizing relay R6. Contacts R6A close to energize the throttle solenoid and clutch coil control relay. when the float switch has closed to energize relay R11, contacts R11A are closed.

If the engine refuses to start, the control will allow the engine to crank for approximately 1/2 minute for the first attempt. This will be followed by short rest and subsequent cranking periods for a total time of about 1-1/2 minutes. Sequence is as follows:

Thermo H2 heats through contacts R2A while the engine is cranking, and when its contacts T2 close, relay R2 is shorted out. Contacts R2A open to discontinue cranking and disconnect thermo heater coil H2. This thermo cools for the rest period and when its contacts T2 open, relay R2 becomes energized to initiate the second cranking cycle, etc.

Thermos H1-1 and H1-2 provide for a total time limit of cranking. H1-2 heats continuously and when its contacts T1-2 close, heat is applied to H1-1 thermo. when T1-1 contacts close, relay R3 and overcrank signal light OCL are energized. Relay R3 locks in electrically and contacts R3D open to break the ground circuit to relays R1 and R2 de-energizing the engine cranking and running circuits. Contacts R3A close to energize the alarm circuit.

Thermo H3 (oil pressure thermo) provides a delay to prevent the controls from shutting down the engine on low oil pressure immediately after the engine starts and before the pressure has reached its normal value. If the oil pressure drops below the setting of the pressure switch while the engine is running, this switch will close and complete the ground circuit to heater H3. After approximately 15 seconds, T3 contacts close completing the ground circuit to relay R5

SYMBOL	DESCRIPTION
R1	IGNITION RELAY COIL
R2	CRANK RELAY COIL
R3	OVERCRANK RELAY COIL
R4	HIGH WATER TEMPERATURE RELAY COIL
R5	CRANK TERMINATION RELAY COIL
R6	THROTTLE CONTROL RELAY COIL
R7	PILOT RELAY COIL
R8	ELECTRIC MOTOR LOCKOUT RELAY COIL
R9	LOW OIL PRESSURE RELAY COIL
R10	SHUT-DOWN RELAY COIL
R11	FLOAT RELAY COIL
C1	IDLE DELAY RELAY COIL
A	STARTING IDLE PNEUMATIC DELAY
OCL	OVERCRANK LIGHT
OL	LOW OIL PRESSURE LIGHT
HI-1 & HI-2	OVERALL CRANKING LIMIT THERMO
H2	INTERRUPTER CRANKING THERMO
H3	ENGINE OIL PRESSURE THERMO
T1 to T4	CONTACTS OF HI TO H4 THERMOS
CB	CIRCUIT BREAKER
r	RESISTOR
H4	ELECTRIC MOTOR LOCKOUT DELAY THERMO
WL	HIGH WATER TEMPERATURE LIGHT
1 to 16	ENGINE WIRING TERMINALS
A to F	RELAY CONTACTS. EACH CONTACT CARRIES THE RELAY COIL DESIGNATION AS IT'S PREFIX. (ILLUSTRATED)
RS	REMOTE SWITCH (OPTIONAL)
MAG	MAGNETO (OPTIONAL)
ALM	ENGINE FAILURE ALARM
SM	ENGINE STARTING MOTOR
BAT	BATTERY
OPS	LOW OIL PRESSURE SWITCH
WTS	HIGH WATER TEMPERATURE SWITCH
FS	FLOAT SWITCH
SC	STARTING MOTOR CONTACTOR
GEN	BATTERY CHARGING GENERATOR

OROVILLE

CONSTRUCTION HEADQUARTERS

SEWAGE LIFT STATION

REVISED AS-BUILT ELECTRICAL CONTROL SCHEMATICS

JUNE 1968

SS-260

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